

# Runway Information and Selection

Selecting a runway for takeoff or landing would seem to be a simple process. You need something that's appropriate and large enough for use with your aircraft, something with favorable winds (if there are any), and something with the correct landing aids if conditions warrant. Plus, you would want something that's actually *available* for your takeoff or landing.

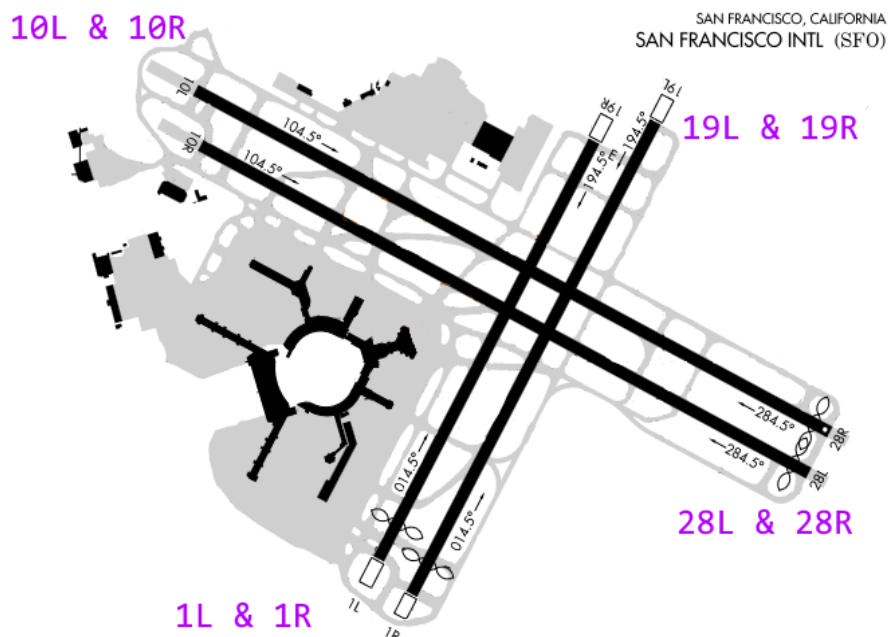
And if you're the type to listen to ATC, you would also likely want to select a runway that they're using... or at least *to not conflict with the ones they're using*. Just try landing on Rwy 9 when AI are taking off on Rwy 27. *On second thought, don't do that...*



The FSCaptain FCDU now gives you a keen *near real-time* insight into the runways for your Departure and Destination airports, so you can be aware of all these factors!

To test this, let's spawn at KSFO, and once we've logged in and have chosen a flight, let's click the PLN button to go to the Flight Plan screen, and then click the LSK for the **DEPT RWY [ ] >** label.

We already know from our charts that KSFO has two sets of intersecting parallel runways, giving us eight runway IDs – 1L & 1R and 19L & 19R, together with 10L & 10R and 28L & 28R.



The Runways pages displays each set of runways in sequence: 1L and 19R, 10R and 28L, etc. for a total of four runways per page... so KSFO has two pages of runway data. (The current page – in addition to the total pages available – are shown in the upper-right display area of the FCDU.)



Let's continue working down the page.... You may not be familiar with the term "Flight Rule" as it's used here. It's not the type of flight plan that you're using, *but it is related*. Here it's the "rule" which governs an airport's operations. If an airport has no clouds, or nothing to impede visibility, that airport would be under "Visual Flight Rules," or *VFR*. If an airport had low clouds, or visibility of only a few miles (kilometers) it might be under "Instrument Flight Rules," or *IFR*. There are a few other "flight rules" you may see which are listed further on in this document.

Here's the METAR that was used for the weather information for these pages:

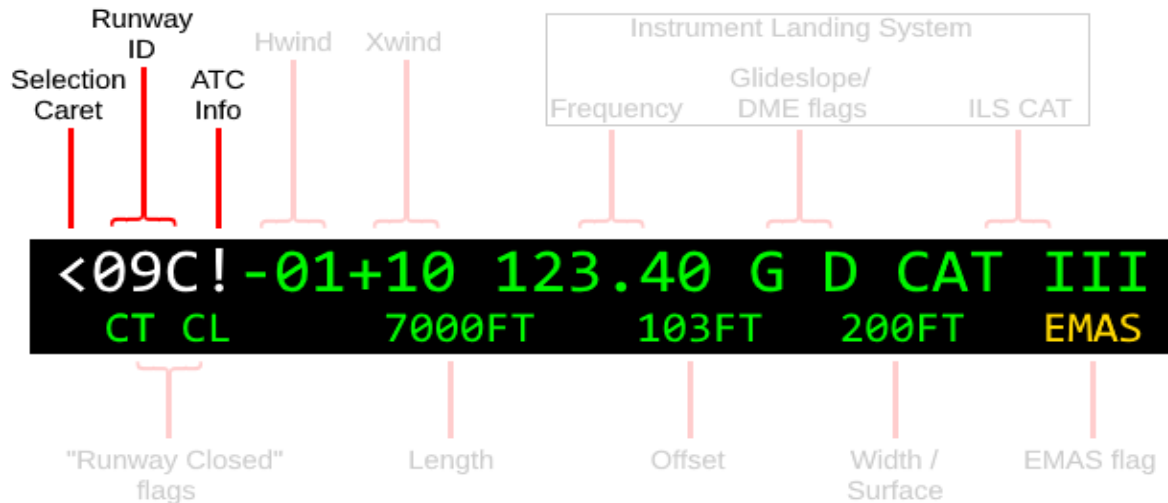
**KSFO 302156Z 27012G15KT 10SM FEW015 SCT035 SCT150 19/12 A2980 RMK AO2 SLP092 T01890117 \$**

The winds are from **270 at 12kts with gusts to 15kts**. With **10 miles of visibility**, and **Few clouds at 1500ft**, the Flight Rule is VFR. The 10s and 28s have light crosswinds, and the 1s and 19s have moderate crosswinds. The 28s have favorable headwinds, and the 10s have nearly prohibitive tailwinds(!). The 1s and 28s are already in use by ATC traffic, so with that in mind, plus favorable headwinds, and light crosswinds, it appears that the 28s would be the preferred runways for our takeoff.

All eight runways at KSFO are available for Takeoff – you can tell such because of the "<" on each runway line. If a runway was Closed for Takeoff, there would be a "CT" token on the runway's secondary display line. (Runways 1L and 1R are both Closed for Landing, so they have "CL" tokens present.)

Our ATC here is using a pattern that's normally used at KSFO in the real world. Runways 1L and 1R are currently being used by ATC for Takeoff. Runway 28R is currently being used for Landing. And Runway 28L, is currently used for both Takeoff and Landing. Lets explain *how this is displayed...*

This is the legend for all of the data that's possible to view on any Runway Information line. We'll begin by looking at the first cluster of three items. They include:



- **Selection Caret** – When accessed from a PLN screen, this appears if a runway can be selected or deselected. You cannot select a runway if you first don't go to the PLN screen.
- **Runway ID** – This is the two- or three- character Runway ID. **01**, **13L**, **04C**, **28R**, **36W**, etc. are all valid values.
- **ATC Info** – This indicates if the ATC has assigned a BGL-based AI aircraft to this runway:
  - The “ ‘ ” character shows that an aircraft has been assigned to Land on this runway.
  - The “ . ” character shows that an aircraft has been assigned to Takeoff from this runway.
  - The “ ! ” character shows that aircraft have been assigned to both Takeoff and Land using this runway.

This cluster of three items can appear in one of six different colors to signify the runway's selection status:

1. White – Runway is selected.
2. Green – Runway has no issues to prevent selection.
3. Yellow – Runway has a minor issue to consider in selection.
4. Red – Runway has a major issue to consider in selection.
5. Cyan – Runway has a surface that cannot support your aircraft. *This is off by default in 1.8.4 Alpha.*
6. Grey – Runway cannot be selected; it's marked as “Closed” for your operation.

Please be aware that any runway that is not listed in Grey can be selected, but only if you access the Runways screen from the PLN screen. The Cyan – Red – Yellow colors are there *only as guidance*.

If this cluster is displayed in Yellow, the runway usually has something non-critical such as a tailwind component of 10 – 12 knots, or a crosswind component greater than 16 knots but less than the aircraft's Maximum Crosswind value. The runway could also be slightly shorter than required for your aircraft's use – something itself to take account of!

If this cluster is displayed in Red, the runway likely either has a tailwind component greater than 13 knots, or a crosswind component greater than the aircraft's crosswind value. Another factor could be if the runway is *very much shorter* than required. Finally, if you're landing at this airport and if the airport has a Flight Rule of LIFR (or worse), and the runway either does not have a glideslope, or lacks sufficient ILS CAT abilities, this cluster can appear in Red.

Now all of this covers “too low” visibility, as well as “too high” crosswinds and tailwinds, but what about “too high” *headwinds*?

Well there are no regulations that we know of for a “max headwind component” for takeoff or landing. Some real-world airlines may have their own guidance / restrictions, and each Captain can apply their own experience as needed. But we have decided to flag any headwind greater than 35kt – 50kt (depending on the aircraft size, and the airline's “Max Winds” allowance) in Yellow.

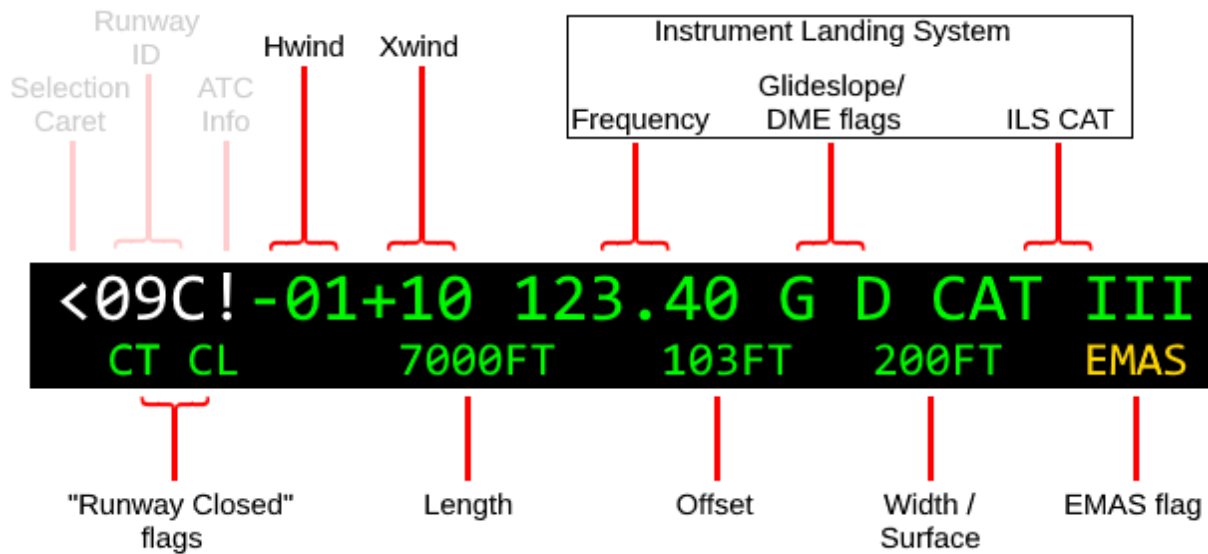
Again, none of this will prohibit you from selecting any runway which isn't marked as Closed. You are the Captain. You are in charge.

So while you may select Yellow- or Red-coded runways, please know that doing so will put you on the edge of (or in the case of Red-, *well outside of*) acceptable safety limits. And yes, you can find airports with runways in either all Yellow or even in *all Red*. An airport with all Red runways indicates severe caution needs to be taken! Such an airport would be considered as *closed* in real-life.

The idea of taking off or landing in the middle of a cyclone / hurricane / typhoon may sound thrilling. And if you can execute a problem-free transition in those conditions, *good on you*. But if such an experience results in *a problem*... well, your airline may have something to say about your choice.

Remember our motto: ***Fly safely – Fly ACME!***

Now we can look at the other fields in the runway display:



- **Hwind** – The headwind component for this runway. The form of the + / - indicator is taken from this Option value:  
`POSITIVE_HEADWIND=0; 1 = Headwinds will be noted with a '+'.` `0 = Headwinds will be noted with a '-'.`
- **Xwind** – The Crosswind component for this runway. The form of the + / - indicator is taken from this Option value:  
`POSITIVE_CROSSWIND=0; 1 = Crosswinds from the right will be noted with a '+'.` `0 = Crosswinds from the right will be noted with a '-'.`
- **ILS Frequency** – If the runway has an Instrument Landing System, this would be the NAV frequency which it uses.
- **ILS Glideslope / DME flags** – These signal if an ILS has a Glideslope and its own DME source.
- **ILS CAT** – If an ILS supports CAT II or CAT III approaches, that would be indicated here. The Option value “Respect ILS CAT II and III” would need to be enabled to display this data.
- **Runway Closed flags** – Shows if a runway is marked as Closed for Takeoff or for Landing.
- **Length** – The length of the runway. If a runway has a Hard surface, but is narrow, it would limit the acceptable Crosswind component for an aircraft....
- **Offset** – The length of any “displaced threshold” at the start of a runway. (You cannot land on a displaced threshold, so if a runway has a Length of 8000 ft and an Offset of 200 ft, its effective landing length would be 7800 ft, even though its takeoff length would be 8000 ft.)
- **Width / Surface** – The width of the runway for “Hard” runways. Other notations used here are “SOFT” for Soft runways (Grass, Dirt, Sand, etc.) “WATER” for Water runways, “SNOW” for Snow runways, “ICE” for Ice runways, and “UNKNWN” for runways whose surface is Unknown to FSCaptain.
- **EMAS flag** – Indicates if an EMAS is in use at the Departure End of the Runway. The Option value “Respect EMAS Installations” needs to be enabled in order to display this data.

To Select a runway, just click on the LSK to the left of the Runway's Selection Caret. When you do this, the Runway ID group becomes White. If you click the LSK for a Selected Runway, the Runway ID group turns back to its former color, as the Runway is now *Deselected*.

## Runway Selection and Taxi Out

Back at KSFO, of all of the preferred runways we've chosen 28L as our Departure Runway, and have started our taxi.

Now let's go to the Flight Menu – this screen now shows ATC and Winds information in real time for our runway. This information is updated every few seconds, so it's always current! Gusts and / or variable winds will make these numbers *dance*.

We can see there are still Takeoffs and Landings happening on 28L (it's the “!” character), and the wind appears to not have changed very much from the last METAR report, with a *Headwind of 12kt*, and a *Crosswind of 1kt*.



We're also reminded of the ILS frequency and the fact that 28L has its own DME source – all in case we wish to dial that in to our NAV radio to ensure we will line up on the correct runway, and to have a current “distance report” as we start our takeoff roll. (We don't note the fact that 28L has a Glideslope during Taxi Out, since it's not terribly helpful for Takeoff.)

If the runway has an EMAS installation, that would also be listed here, as an EMAS would be very useful in case of a Rejected Takeoff (RTO).

“EMAS” stands for *Engineered Materials Arresting System*, which is an array of special concrete blocks that are designed to crumble when a certain amount of weight and force are applied to them. Sited at the Departure End of a Runway, they limit runway excursions. (EMAS is not currently implemented in FSCaptain. *Ahem*)

# Runway Selection and Designated Deicing Facilities (DDFs)

Runway Selection comes into play for one other FSCaptain feature – Designated Deicing Facilities. Until now, using DDFs would have the FCDU to assign you to the DDF currently closest to your aircraft – not necessarily the DDF *closest to your departure runway*.

Remember that deicing at a DDF means your Holdover Time countdown would begin closer to the runway than it would if you deiced at your gate. Now that the FCDU can know which runway you plan to depart from, it can direct you to the DDF that best suits your current needs.

You do need to check that your DDF lists the runways which it supports. This has been planned since DDFs were first introduced in early 2017. We have updated the ddf\_fsc.txt files to include runway support for most DDFs.

KSFO doesn't have much need for deicing, so here are some sample screens from a nighttime taxi out at KBOI:

We see that Runway 28R has already been selected from our .PLN file (it's colored White), so let's look at the METAR for this flight:



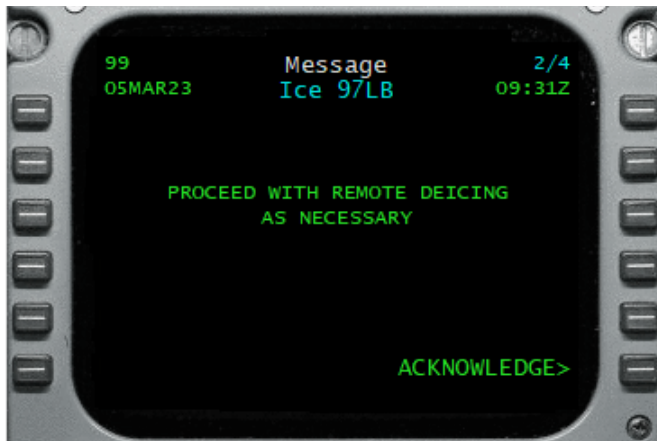
```
KBOI 050853Z 31004KT 6SM -SN BR FEW015 OVC033 00/M02 A2966 RMK AO2
SNB04 SLP054 P0000 60001 T00001022 53038 $
```

That gives us **4kt winds from 310**, **moderate visibility**, and a **cloud deck up at 3300ft**. However there's light snow, and the temperature is 0C. That seems like good conditions for ground ice to form.

There's no AI traffic, so we can announce ourselves for any runway we wish to use. 28R seems to be the closest and most appropriate runway, so we will leave everything *as-is* and use 28R.



After Loading is done, we see that our airframe does have ground ice, so we'll select DEICE AT DDF> to see that we should proceed to our assigned DDF....



After completing Pushback, we're now on the Flight Menu, and we see that we're assigned to PAD EAST, so we'll select the LSK for <DEICING to look at all of our choices.



In the details, we see again that we're assigned to PAD EAST, which is 1426 meters to the Southeast.



Let's click on <NEXT DDF to see what our other options for a DDF are:



It's PAD WEST which is closer to us (1255 meters to the Northwest). But since 28R is our Departure runway, we don't want to use PAD WEST. That's why we were originally assigned to the DDF closest to our runway... PAD EAST.

# Definitions of Runway-associated Items

## “Flight Rule” values

There are seven different “Flight Rules” which we use that are categorized for their “Flight Ceiling” and “Flight Visibility”. We’ve put them into a table and used the colors which online agents such as SkyVector have adopted. Different countries’ Aviation Authorities have different definition values, but FSCaptain has chosen to follow the FAA’s (United States’) current set of definitions.

1. VFR – Visual Flight Rules.
2. MVFR – Marginal Visual Flight Rules.
3. IFR – Instrument Flight Rules.
4. LIFR – Low Instrument Flight Rules. *Glideslope encouraged.*
5. CAT I – *Glideslope required.*
6. CAT II – *Glideslope required.*
7. CAT III – *Glideslope required.*

Flight Rule	Ceiling		Visibility
VFR	> 3000 FT	AND	> 26400 FT
MVFR	< 3000 FT	OR	< 26400 FT
IFR	< 1000 FT	OR	< 15480 FT
LIFR	< 500 FT	OR	< 5280 FT
CAT I	<= 200 FT	OR	< 2640 FT
CAT II	< 200 FT	OR	< 2400 FT
CAT III	< 100 FT	OR	< 700 FT

Real World Conditions would use Runway Visual Range (RVR) values and Decision Height (DH) values for the CAT I to CAT III categories, but since our flight simulators do not supply these values, ACME uses the METAR-derived values for Ceiling and Visibility. We’re also aware that in real life, *the aircraft has to be able to support such landings* and CAT II and CAT III landings must be negotiated with the airport’s control tower. But given the limitations of our simulators’ ATC, such negotiations are presumed to have occurred by Dispatch.

## Default “Tailwind” values for fixed-wing aircraft:

10-12 kt – Yellow “caution” flag.

13+ ks – Red “warning” flag.

(These are hard-coded values for now, and apply to all aircraft.)

In short, you should always take care when landing with any tailwind. It increases your landing distance as well as your landing speed – the higher the wind speed, the greater. There is no regulation we know of to prohibit landing with an excessive tailwind, but airlines would frown on such action. So we’re not preventing you from selecting such runways, but we are encouraging *careful consideration*.

## Default “Maximum Crosswind” values for fixed-wing aircraft:

A/C Size	Piston	Turbo
-----		
Tiny	12kt	12kt
Small	15kt	25kt
Medium	25kt	30kt
Large	30kt	40kt
Heavy	35kt	50kt

If you know of custom values for any of your aircraft, you can add them to your aircraft’s Override configuration file using either (or both) of these variable types:

- `Max_Crosswind_T` – the Max Crosswind value for Takeoff.
- `Max_Crosswind_L` – the Max Crosswind value for Landing.

As an example, a Maximum Crosswind at Takeoff value of 28 would be entered as such:

```
Max_Crosswind_T=28
```

(Future builds of FSCaptain will allow such editing to occur in the Administrator.)

If you enter a value for only Takeoff or Landing, that value will be used for both situations.

As with Tailwind section earlier, we will not prevent you from selecting such runways, but we flag these things so that you have an eye on potentially hazardous conditions.